Endothermic and Exothermic reactions

QUESTION: **Classify the following reactions as endothermic or exothermic**

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| **Reactions** | **Endothermic or Exothermic reaction** |
| When solid sodium hydroxide is added to water, the temperature increases. |  |
| H2O() → H2O(*s*) |  |
| C6H12O6(*s*) + 6O2(*g*) → 6CO2(*g*) + 6H2O(*ℓ*) Δr *H°* = *–*2 820 kJ mol–1 |  |
| **ice 🡪 water** |  |
| 2H2(*g*) + O2(*g*) 🡪 2H2O(*g*) |  |
| NH4NO3(*s*) → NH4+(*aq*) + NO3–(*aq*) Δr*H* = +25.7 kJ mol–1 |  |
| **water vapour condensing** |  |
| C2H4(*g*) + H2O(*g*) → C2H5OH(*g*) Δr*H* = –48.0 kJ mol–1 |  |
| H2O(*g*) → H2O(*ℓ*) |  |
| CH4(*g*) + H2O(*g*) → CO(*g*) + 3H2(*g*) 206kJ of energy is absorbed |  |
| When zinc powder reacts with copper sulfate solution, the temperature rises. |  |
| NaOH(*aq*) + HCl(*aq*) 🡪 NaCl(*aq*) + H2O A temperature increase occurs. |  |
| N2(*g*) + 2N(*g*) Δr*H* = +934 kJ mol–1 |  |
| H2(*g*) + I2(*g*) $ 2HI(*g*) A temperature decrease occurs. |  |
| 2H2(*g*) + CO(*g*) $ CH3OH(*g*) Δr*H* = –128 kJ mol–1 |  |
| C(*s*) + O2(*g*) 🡪 CO2(*g*) Δr*H* = –393 kJ mol–1 |  |
| Formation of snow from water vapour. |  |
| 90310q1d |  |
| When magnesium is added to hydrochloric acid a reaction occurs and the temperature of the reaction mixture increases. |  |
| H2(g) + 1/2O2(g) H2O(g) Δ*r*H = -286kJ mol-1 |  |
| Photosynthesis – food-making process in plants |  |
| Freezing of water |  |
| Dissolving sodium hydroxide in water (the temperature increases) |  |

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